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ABSTRACT

Findings and recommendations presented in this study of the role and nature of doctoral disserations are based on deliberations of a task force of graduate school deans and 48 reports submitted by selected universities. Findings are offered in the areas of: distinguishing characteristics of dissertation research and dissertations; originality, significance, independence; collaboration; content and form of the dissertation; publishability; intensive participation in doctoral research; time to completion of the dissertation; guidance for dissertation advisers; dissertation defense; and expert advice and editorial help. It was generally agreed that (1) dissertation research should provide students with hands-on, directed experience in the primary research methods of the discipline, and should prepare them for the type of research/scholarship that will be expected of them after they receive the Ph.D. degree. It was also agreed that: (2) where doctoral research efforts are part of a larger collaborative project, the individual student's contribution should be precisely delineated; (3) in cases where students' research is enmeshed in their advisers' projects, clear written understandings should be formulated at the outset about respective rights to the data generated and other intellectual products; and (4) the student's progress on the dissertation should be reviewed and the appraisal shared with the student on an annual basis. The report concludes with nine references, a working paper for the study, and a list of institutions participating in the study. (LPT)

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CGS TASK FORCE ON THE ROLE AND NATURE OF THE DOCTORAL DISSERTATION

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THE ROLE AND NATURE OF THE DOCTORAL DISSERTATION

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Foreword

This report describes the year-long study of the role and nature of the doctoral dissertation carried out in fifty universities in the United States and Canada under the auspices of the Council of Graduate Schools. The report summarizes a wealth of information on current policies, practices, and points of view related to the research component of Ph.D. programs, and from that information distills recommendations and ideas for improving doctoral education. Perhaps most important among these is the reaffirmation of the crucial role played by the dissertation adviser, and the need for institutions to do all they can to ensure that graduate students and their advisers form intellectually productive partnerships based on mutual respect and devotion to scholarship.

We believe this study, particularly in conjunction with two other CGS publications, *The Doctor of Philosophy Degree* (1990) and *Research Student and Supervisor: An Approach to Good Supervisory Practice* (1990), will be especially useful to graduate deans and other administrators interested in examining their institution's approach to doctoral education, and to all graduate students and faculty members engaged in doctoral research.

Jules B. LaPidus
President
Council of Graduate Schools
January 1991

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Introduction

Background for the Study

Bernard Berelson's *Graduate Education in the United States*, published in 1960, was one of the first of a number of books and articles about major contemporary concerns with graduate education, in general, and the Ph.D., in particular. In his now classic work Berelson analyzed and discussed the results of a survey that provided valuable data on most of the very issues, including the role and nature of the dissertation, that concern us today.

Some thirty years after the appearance of Berelson's landmark work, Theodore Ziolkowski published "The Ph.D. Squid," whose title is a play on William James' turn-of-the-century metaphor of the "Ph.D. Octopus." In his essay Ziolkowski also provides statistics and offers insights on the history and present-day state of doctoral education in North America. Perhaps more than most of his predecessors, Ziolkowski goes beyond statistics and analyses to make several thoughtful recommendations for improving Ph.D. education, especially with respect to the dissertation.

Today's growing interest in the role and nature of the dissertation is not limited to the higher education community. Along with educators and politicians, the general public has begun to ask searching questions about the way we train Ph.D.s, and these questions invariably lead to the "why, what, and how" of the dissertation. Why we require the dissertation and what it should be are, of course, engaging questions. How the conceptualization and writing of the dissertation bear on the time it takes to acquire the degree or on the ability of students to complete the degree are, indeed, among the paramount concerns of dozens of the deans, faculty, graduate students, and others who participated in this study.

Attrition and time-to-degree share the spotlight with a growing preoccupation with the challenges of the changing environment of graduate education and, concomitantly, the latter's shifting processes. The preface to the findings submitted for this project by the University of Michigan succinctly states the chief concerns, with respect to these challenges and changes, shared by most of the participating schools: "(1) the need in many fields to expedite progress through the dissertation process without adversely affecting the quality of the experience of the research itself . . . and (2) . . . continual need to adapt research paradigms and tools to take advantage of the rapidly expanding technical and informational resources on which sophisticated research projects can draw." As evidence that the focus of concern may have shifted over the last decade and a half or so, the two salient areas quoted above contrast with attitudes expressed by faculty, students, and alumni polled in 1976 by Michigan's Rackham School of Graduate Studies. In other words, time-to-degree and the changing research environment seem to be of greater concern today than they were fifteen years ago.

*Throughout we use "dissertation" and "thesis" interchangeably.

Under the heading of these two general areas of concern, several recurring themes dominated discussions on the individual campuses of the participating universities, as well as at meetings of CGS regional affiliates and among task force members and the representatives who met to formulate recommendations on the content and composition of this publication. The most prominent of these themes include adviser-advisee relationships; when a topic is chosen and how soon in the course of their studies students should begin to work on the dissertation; students' and faculty's expectations with regard to the scope and substance of the thesis, and, relatedly, length, originality, and significance; collaborative and team research; intellectual property rights; whether published-article options are acceptable and/or desirable; and the need to compete with other post-baccalaureate alternatives for the best students.

Wherever and whenever the role and nature of the doctoral dissertation was discussed, there was general, often enthusiastic agreement that it was a discussion whose time had come—one that needed to involve many knowledgeable individuals from a broad range of Ph.D.-granting institutions. Moreover, members of the CGS task force, as well as representatives from the participating universities, agreed that this publication should not only inform, raise consciousness, and inspire further discussion, but contain recommendations and guidelines designed to assist faculty, administrators, and students in addressing the role and nature of the dissertation within the changing and challenging environment of graduate instruction, research, and scholarship.

Procedures for Carrying Out the Study

CGS launched the study by appointing a task force of graduate deans from seven research universities to formulate the project and oversee its operation. The next step was to invite forty American and three Canadian universities to participate in the project. In addition, all CGS member institutions were invited to discuss the issues and share the outcomes of those discussions with the task force. A list of those institutions that participated in the study appears in Appendix A. Participants then received a document consisting of a set of questions designed to elicit views and stimulate discussion. This "working paper" recommended that the participating graduate administrators employ whatever procedures they deemed appropriate to conduct the study on their individual campuses.

At six universities the deans themselves, either after consulting with other administrators and perhaps a few faculty or drawing exclusively on their own experiences and perceptions, submitted personal reports. Eighteen universities appointed ad hoc committees or used subsets of graduate faculty councils. Eight placed the matter before the entire membership of their graduate faculty councils, and one called on its graduate executive board. At sixteen universities, the "working paper" was used as a questionnaire to survey faculty across the relevant disciplines. Ten schools held what amounted to university-wide discussions involving faculty, students, administrators, and alumni. (A minority of nine included graduate students in the discussions, and two invited alumni to participate.) Some universities used a

combination of approaches. Whatever the approach, all of the procedures yielded valuable information, insights, and recommendations.

Graduate deans from the participating universities met twice—in January and July 1990—in Washington, D.C., to report on the issues raised and the conclusions reached in their campus discussions and, as a group, to consider those issues. The seven-member task force of graduate deans also met twice, at the beginning of the project and at its conclusion, to respond to a draft of this document and to make suggests for the final version. The following section summarizes the key recommendations that emerged from the task force's final deliberations for improving the dissertation process and product. Thereafter a section on "Findings" presents a synthesis of the sentiments expressed in the forty-eight reports submitted and in the meetings of graduate deans for the participating universities.

Recommendations

Role of the Dissertation and Dissertation Research

>> The doctoral dissertation should (1) reveal the student's ability to analyze, interpret, and synthesize information; (2) demonstrate the student's knowledge of the literature relating to the project or at least acknowledge prior scholarship on which the dissertation is built; (3) describe the methods and procedures used; (4) present results in a sequential and logical manner; and (5) display the student's ability to discuss fully and coherently the meaning of the results. In the sciences the work must be described in sufficient detail to permit an independent investigator to replicate the results.

>> The dissertation is the beginning of one's scholarly work, not its culmination. Dissertation research should provide students with hands-on, directed experience in the primary research methods of the discipline, and should prepare students for the type of research/scholarship that will be expected of them after they receive the Ph.D. degree.

Relationship to Course Work

>> Scholarly activity and research should be encouraged from the outset of a student's graduate program, not introduced at an advanced point in the student's career. Involvement at early stages in a research program facilitates intensive participation and rapid progress and is characteristic of the physical and biological sciences, engineering, and, to some extent, the behavioral sciences.

The Dissertation as a Report of Scholarship or Research

>> Differences among the disciplines—Disciplinary diversity affects the dissertation process and product. Any set of university-wide standards and require-

ments must acknowledge and accommodate the differences in how scholars in different disciplines conduct their work and how this diversity is reflected in expectations for the Ph.D. dissertation.

>> The question of originality—In its most general sense, "original" describes research that has not been done previously or that creates new knowledge. Although a dissertation should not duplicate another researcher's or scholar's work, the topic, project, or approach taken need not be solely that of the graduate student. An adviser or other faculty member should encourage a student to explore a particular topic or project with the idea that the student himself or herself will independently develop the "thesis" of the dissertation. The student should be able to demonstrate what portion of the research or scholarship represents his or her own thinking.

>> The question of collaboration—In those disciplines where doctoral research efforts are typically part of a larger collaborative project, it is crucial that an individual student's contribution be precisely delineated. Whether the collaboration is between faculty and student or among students, Ph.D. candidates are expected to be able to demonstrate the uniqueness of their own contributions and to define what part of the larger work represents their own ideas and individual efforts.

Form of the Dissertation

>> Although the "traditional" dissertation as a unified work with an introduction that states an objective, a literature review, a presentation of the methodology or procedures to be used, and a concluding discussion of results should be respected, flexibility with respect to form also should be permitted. Some disciplines, mainly in the sciences, already permit inclusion in the dissertation of research papers or scholarly articles published by the student. This practice should be adopted more frequently by the humanities and social sciences. Whatever the discipline, the published work must be logically connected and integrated into the dissertation in a coherent manner. Binding reprints or collections of publications together is not acceptable as a dissertation in either format or concept.

Adviser-Advisee Relationship

>> One of the most important contributions an adviser can make, both to reducing the time spent in the process and to facilitating completion of the dissertation, is to help students select manageable topics and to discourage them from undertaking that which is too broad in scope to complete in a reasonable and timely fashion.

>> In those cases where graduate students' research is enmeshed in their advisers' projects, clear, written understandings should be formulated at the outset about respective rights to the data generated and other intellectual products.

>> Dissertation advisers should themselves be actively involved in advanced research and scholarship and in the graduate programs of their institutions.

>> New doctoral students should be advised to meet all prospective dissertation advisers and talk with other students in the program about the attributes of various advisers. To facilitate this practice, departments should provide students with (1) an annually updated list of graduate students with their dissertation topics and the names of their advisers, and (2) a similar list of departmental members of the graduate faculty with information about their areas of research, selected references to their publications, and indication of their availability to supervise dissertations.

Administrative and Faculty Support

>> Faculties are strongly encouraged to prepare handbooks for dissertation directors and students that codify what the discipline expects of graduate education, in general, and the dissertation, in particular. Guidelines should focus on the mutual responsibilities of advisers and students and should include targets for the periods of time needed to complete each major stage in doctoral studies: i.e., course work, master's thesis (where applicable), qualifying examinations, dissertation prospectus, and completed and defended dissertation.

>> Departments and programs should review periodically the expectations of their disciplines with respect to Ph.D. education, and they should relate the role of the dissertation to those expectations.

>> Graduate schools should require every department to do at least an annual review of each student's progress on the dissertation and to share that appraisal with the student.

>> Graduate schools should collect and make available data on how long students take to complete their dissertations and degrees in each department.

Findings

Ten questions about the role and nature of the doctoral dissertation posed in a working paper prepared by CGS (see Appendix B) provided the framework for discussions at participating universities. This section summarizes the responses to key issues and questions addressed in the universities' written reports and in the final meeting to discuss the topic. Not surprisingly, the study revealed that from university to university there is considerable uniformity of opinion with respect to many established policies, practices, and traditions. Wherever they appear, however, dissenting opinions and varying practices are noted.

Distinguishing Characteristics of Dissertation Research and Dissertations

Dissertation Research. What is considered appropriate dissertation research varies widely among disciplines as well as within fields. Although there is general agreement that a doctoral research project should be original, substantial, significant, and independently carried out, disciplinary differences emerge when one seeks to define the terms. Diverse pedagogical needs and disciplinary research practices result in different kinds of research projects whose originality and significance are assessed according to the standards of the discipline. In the hard sciences at one university, for example, "substantial" implied an extensive laboratory investigation of a question that ranks highly in national funding priorities and, therefore, is of significant interest to a large external research community. In the humanities and "softer" social sciences, on the other hand, "substantial" referred to the extent or depth of a research project without reference to funding opportunities or external priorities.

Within most disciplines agreement exists about what constitutes an appropriate doctoral research project, but there are exceptions. At one university anthropology, psychology, and, most notably, physics acknowledged a lack of consensus on this issue. A faculty member in the physics department wrote:

> . . . a student working in experimental elementary particle physics will typically be part of a very large project. Accordingly, the students are often unable to form an overall perspective of the project. This kind of team research tends to be very technical and 'task oriented.' In contrast, a student in theoretical particle physics would typically work individually, under the direction of a professor or postdoctoral scholar. . . . Ideally, a dissertation project would be self-contained, would allow individual initiative to flourish and would address philosophically interesting and non-trivial issues. In practice, many styles of research in physics are not compatible with these 'ideals'.

An increasing split is also evident among humanists about the nature of their work and their expectations of a doctoral research project. One report stated that a majority of the humanists at that institution, as elsewhere in the nation, continue to expect a "traditional" dissertation, characterized by the statement of a problem, an historical literature review, an analysis of primary sources, and a statement of conclusions that make a significant contribution to the body of knowledge in the field. A minority of humanities faculty members, however, reject the notion that such a "body of knowledge" exists and prefer to use the metaphor of a "continuing conversation," which the doctoral student joins without having to review everything written previously on the subject. In this view, the dissertation should simply develop an original idea. The report suggested that graduate schools should keep a watchful eye on the progress of doctoral candidates in the humanities over the next five to ten years to assure that they do not get caught in the ideological cross fire while they are still students and to assess from their postdoctoral professional progress the direction the humanities are taking in this debate.

Differences are also apparent in the nature of acceptable research projects in those disciplines that award the Ph.D. degree for different purposes. Three functions of doctoral education identified in one university report are (1) to prepare basic researchers and university faculty, (2) to prepare researchers for work in non-academic settings where the employer or other sponsoring agencies set the research agendas, and (3) to prepare practitioners of a profession.

Appropriate doctoral research projects in disciplines that award the Ph.D. in preparation for professional practice differ significantly from those in disciplines that award it as a research degree. In the latter case the development of new theories is highly valued, whereas in the former it is permissible to apply generally accepted theory to a current problem in order to find a viable solution. Nevertheless, even practicum-oriented dissertations often require considerable theoretical sophistication and thus also should advance methodology and understanding in the field. One graduate dean was of the opinion, however, that faculty do use different criteria to judge the dissertations of those who are not going into academia and for whom, therefore, the dissertation is used as training to do something in depth and well but not as the basis for articles or a book.

To the extent that the Ph.D. is considered a research degree, most graduate deans agreed that a doctoral project should be an apprenticeship, a guided learning experience that introduces a Ph.D. candidate to advanced scholarship and prepares him or her to conduct research without supervision in a professional career. Whether the student works alone or on a team, the research project should be an original, theory-driven investigation characterized by rigorous methodology and capable of making a significant contribution to knowledge about the subject under study.

Dissertations. As a record of the research experience, stated one university report, "the dissertation may take different forms, depending on the nature of the research itself, the customs of the discipline, the culture of the university, and the pedagogical judgment of the student's mentor." The document should, however, demonstrate breadth of scholarship, depth of research, and ability to investigate problems independently and efficiently.

"Regardless of the differences certainly and naturally existing among the various fields and disciplines of study," stated another report, "the dissertation must be an extended, coherent, written work of original research, demonstrating a doctoral candidate's comprehensive knowledge and mastery of methodological, historical, topical, empirical and theoretical issues relevant to the chosen research subject. It must be a significant contribution to scholarship. It must contain the results of extensive critical research of documentary source materials, laboratory work, and/or field work."

The doctoral dissertation, many university reports agreed, should reveal the student's ability to analyze, interpret, and synthesize; demonstrate thorough knowledge of the literature relating to the project or at least acknowledge prior scholarship on which the dissertation is built; describe the methods and procedures used; present results in a sequential and logical manner; and display the student's ability to discuss

fully and articulately the meaning of the results. In the sciences, the work must be described in sufficient detail to permit an independent investigator to replicate the results.

One pocket of dissent was reported in subfields in such scientific disciplines as engineering, physics, and chemistry. Some faculty members in these subfields believe that the purpose of the dissertation process is to enable the student to develop research skills as part of a team engaged in ongoing experimental work. Dissertations directed by these faculty members can "read like technical manuals, the main purpose of which is to allow the next student to pick up from where the previous one left off." Setting the dissertation results in the context of previous work is important, these faculty members generally agreed, but they placed primary emphasis on the dissertation contributing to the "team effort" and staking out territory for the student's future work.

Originality, Significance, Independence: Defining the Terms

"What is original may not be significant and what is significant may not be original," remarked one graduate dean in reference to Berelson's now classic discussion of the traditional conception of the dissertation. Thirty years ago Berelson was at pains to point out that the notion of the dissertation as an original and significant contribution to knowledge was only a statement of intent. Definition of the terms was left to the departments, and serious questions were being raised not only about the realization but about the appropriateness of the aim.

The idea of originality was especially suspect given the extent of team research in the sciences, and the notion of "significant contribution to knowledge" received some hard questioning as well. According to Berelson's findings, the alternative to judging the dissertation by these traditional terms was to consider it an instrument of research training, "a trial run in scholarship and not a monumental achievement." "The primary test would be, in other words, whether it contributed to the student's knowledge, not the world's." When asked, "Should the doctoral dissertation be regarded more as a training instrument than as an 'original contribution to knowledge'?" 55% of the deans, 45% of the graduate faculty, and 40% of the recent degree recipients Berelson surveyed answered yes.

Despite the trend thirty years ago toward judging the dissertation by a different, more realistic standard, originality, significance, and independence have not disappeared from the vocabulary used to describe distinguishing characteristics of the doctoral research project and product. Now as then, defining the terms is difficult, and they continue to mean different things in different fields.

Citing Supreme Court Justice Potter Stewart's frustrated statement that he could not define pornography but that he knew it when he saw it, one university report suggested that defining originality presented similar difficulties. In its most general sense, "original" describes research that has not been done previously or a project that creates new knowledge; it implies that there is some novel twist, fresh perspective, new hypothesis, or innovative method that makes the dissertation

project a distinctive contribution. An original project, although built on existing research, should not duplicate someone else's work.

"Significant" as applied to doctoral research projects and dissertations is also subject to debate. A significant piece of work provides information that is useful to other scholars in the field and, ideally, is of such importance that it alters the thinking of scholars in the student's field of study. A further question is whether the dissertation itself is a significant document or whether the term refers only to the nature and quality of the research. It is difficult, asserts one university report, to argue that dissertations themselves are significant when in many fields they play a minor role as scholarly resources. Particularly in the humanities and the softer social sciences, dissertations are not expected to be cited by scholars in their published work. The notion that doctoral dissertations are significant contributions to knowledge thus seems to represent an ideal rather than a quantifiable fact.

"Independence" or autonomy is intertwined with "originality," and its definition also varies by field. It is dependent on the nature of the research, the resources needed, the adviser's style, practices common to the discipline, and custom in the student's program. According to the report from one university, the experience of most students seems to fall in a three-point spectrum from high to low autonomy.

In the humanities, at the most autonomous end of the spectrum, originality is related closely to independence. A student, although receiving guidance from a dissertation adviser, is usually responsible for both conception and execution of the doctoral research project. Moreover, a teaching assistant's duties, for which the student receives support, are usually unrelated to the dissertation research.

Midway on the independence-autonomy spectrum, a student may develop the idea for the dissertation through interaction with the dissertation director and occasionally with other committee members, and the dissertation director may apply for a grant to support the research. The faculty adviser may retain full supervisory control of the student's work on the research project or permit the student to proceed independently, merely monitoring the progress of research. Assistantship support is typically provided by the grant.

Autonomy is most constrained in the sciences where students often join ongoing research projects for which the principal investigator has received funding. In this setting the idea for the dissertation originates with the principal investigator and grows out of the larger project. The student, whose assistantship is funded by the research grant, must develop, refine, define, and do research on the topic, contributing to the design of the project, to the measurement and collection of new information, and to the analysis and interpretation of information.

At the low autonomy end of the scale when a doctoral student is part of a team pursuing an ongoing research project, the status of the student as an independent researcher is subject to real question and is heavily dependent on the research practices and personality of the principal investigator. In such cases, one university report recommended candid discussion among the faculty, representative students,

and the graduate dean, with the objective of encouraging research practices that protect the academic freedom of the faculty and promote the intellectual growth of the individual student.

Despite differences among disciplines, the consensus was that "original" does not mean "in isolation." The idea for the dissertation project and the approach taken need not be developed solely by the student. It is expected, however, that the student should develop and carry out the research project relatively independently and be able to demonstrate to the satisfaction of the advisory committee what portion of the research represents the student's own thinking.

Collaboration

All dissertation research is collaborative in some sense. Minimally, noted one university report, a student collaborates with his or her dissertation director and Ph.D. committee. Some faculty members asserted that collaboration, even interdisciplinary collaboration, is a fact of modern scholarship. To prevent students from engaging in it would prepare them inadequately. Here, however, as in other aspects of the dissertation process, disciplinary differences are apparent.

In the humanities the model of the lone scholar working independently still prevails. Only one report noted that there may be a movement toward some collaborative research in areas of the humanities affected by recent feminist scholarship. The sciences and engineering, in contrast, are now largely collaborative enterprises. Patterns of federal support for research in these areas often dictate that a number of investigators come together to address large, complex research problems. In these fields a student's doctoral work likely will be an integral part of a larger funded research project. Some students in the social sciences, like their counterparts in the humanities, may be individual researchers pursuing topics on their own, while those working in the behavioral sciences may do their dissertation research as part of a larger collaborative project.

Appropriate aspects of collaborative research include experimental design, data collection, certain technical aspects of data analysis and interpretation, the use and analysis of a common body of data from different perspectives to produce valid individual theses, and emphasis on different aspects of one large research program. In research requiring use of human subjects, several students could collaborate by interviewing the same individuals, but for different purposes.

In those disciplines where doctoral research efforts are typically part of a larger collaborative project, faculty members expressed widespread agreement that it is crucial that a student's contribution be precisely delineated. Students must be able to identify one aspect of the larger project as their own and be able to demonstrate their original contribution. "We see collaboration as an interaction of minds rather than the sharing of results," stated one university's report. "The dissertation should make the individual student's contribution clear." At another university, respondents looked more favorably on a student's collaboration with an adviser than with other students. But whether the collaboration is between faculty and student or among students,

Ph.D. candidates are expected to be able to demonstrate the uniqueness of their own contributions and to define what part of the larger work represents their own individual efforts. In the words of one report, "many students can walk in the same intellectual meadow, . . . but no two can tread precisely the same path."

Delineating a student's individual contributions, however, can be problematic. One university report admonished that the use of the same data in more than one dissertation should be done with great caution. The origin of the data must be carefully documented, and analyses and interpretation of the data must represent an individual effort by the author of the dissertation. Graduate deans and faculty members raised the following concerns:

> (1) Because of the inherent status difference of the participants, student/faculty collaboration can present opportunities for abuse; when students work on faculty projects, conflicts of interest can arise over ownership of the data and the research results. How is an equitable division of credit achieved for collaborative research between a doctoral student and his or her adviser?
>
> (2) How can a student's individual contributions be identified, especially when the dissertation is composed entirely of articles with multiple authors?* Who should be responsible for deciding how to allocate credit, the student's advisory committee or some outside body? One university report noted that the greatest strain on the judgment of the dissertation committee arises when a student's contribution is a small part of a very large collaborative project and when other graduate students will also be drawing on the project for their dissertations. Advisers/research directors need to know just what each student is doing and contributing in collaborative projects.
>
> (3) Graduate students involved in group projects are concerned about clearly identifying an individual's contributions to the project. They want a student to be given credit for what he or she does. Less productive or less successful students should not be allowed to take credit for work done by their peers.

Faculty and graduate students alike see a need for some mechanism to identify and evaluate a doctoral student's individual contributions to a collaborative research project. It is less clear what the nature of that mechanism should be. At many universities the responsibility now rests with the student's adviser and advisory committee. Universities should have clear policies governing collaboration among faculty and students and among students. These policies should assure the integrity of the various functions of doctoral research and protect all parties' rights in the research results.

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*The complexities of this issue are discussed in National Academy of Sciences, *On Being a Scientist* (Washington, D.C.: National Academy Press, 1989), 16–18.

Multiple-Author Dissertations. Since collaborative research projects usually lead to publications with more than one author, the question arises as to whether a doctoral dissertation could have several authors, with each obtaining credit for the work and each thereby being awarded the Ph.D. degree. A check of University Microfilms International (UMI) records indicates that between 1902 and 1987, a period during which nearly one million Ph.D. degrees were granted, only 166 involved co-authored dissertations. In practice the dissertation with more than one author is virtually nonexistent, and faculty members involved in this study were unanimous in rejecting the concept.

Content and Form of the Dissertation

As stressed in the discussion of distinguishing characteristics of a doctoral dissertation, the traditional document is alive and well at all universities participating in this study. The concept of a dissertation as a unified work with a single theme, including an introduction and literature review, a description of methods and procedures used, a presentation of results, and a concluding discussion of the meaning of the results is an ideal held by many faculty members in all disciplines. Yet precisely what constitutes a dissertation and in what forms the material may be presented vary across disciplines and among universities.

Use of Previously Published Work. Among disciplines and even within some departments at a number of universities, faculty opinion is sharply divided over whether students should be allowed or encouraged to incorporate their previously published work into the dissertation. In some disciplines, most notably the humanities, the rationale for disallowing its inclusion is that a dissertation should be a newly-formulated work that makes a fresh contribution, not one that is already part of the literature on the subject. Only one institution, however, reported a university-wide ban against using previously published material in the body of the dissertation; even there reprints of a student's work could be included in an appendix.

In the sciences, where publication and grant-getting often are essential for survival, faculty encourage students to publish their research results as soon as possible, usually long before all dissertation research is completed. Under these circumstances, prohibiting the inclusion of previously published work in a dissertation would be senseless. In all disciplines where the inclusion of such material is permitted, several conditions obtain:

(1) The work must represent research conducted while the student was enrolled in the Ph.D. program, must be the product of the dissertation study, and must not have been used to obtain another degree.

(2) The student should be the sole or primary author of the published work. One university permits the inclusion of multi-authored articles if the student's contribution to that article, and the relationship of the research described in the article to the dissertation, are made clear in the introduction.

(3) Work already published by the student must be logically connected and integrated into the dissertation in a rational and coherent manner. Although a

minority of faculty members in science and engineering at several institutions argued that it should be permissible to do nothing more than bind together enlarged reprints, or even that it should be unnecessary to have a common thread weaving previously published papers into a coherent whole, they are decidedly outnumbered. The consensus is that simply binding reprints or collections of publications together would not be acceptable as a dissertation in either format or concept. Dissertations, the prevailing argument holds, require a fuller review of the relevant literature and a more complete discussion of results and conclusions than a journal would allow. Moreover, it is impossible to distinguish a student's work from that of a supervisor or other students in a published paper unless other parts of the dissertation make clear the student's independent contribution. Finally, the standard of excellence should be set by the university, not by journal editors.

Article-Length Essays. Responses to the question of whether one or more article-length essays should be allowed to constitute all or part of humanities and social sciences dissertations were both positive and negative. Four universities reported that their economics departments either required or allowed several published or publishable article-length essays on a related topic to constitute part of the dissertation. At one university such essay-based theses were also encouraged in management and industrial relations; at another some business faculty were considering the option; at a third dissertations in literature are often a series of article-length essays loosely tied together.

Some universities giving negative responses to the question noted that article-length essays would not constitute a dissertation if the "essay" did not embody research. Others said simply that such a dissertation would not be permitted, noting that at least in the humanities, a dissertation is expected to be a much broader, more comprehensive, monograph-length study.

Options for the Form of the Dissertation. Whether the form of the dissertation is a monograph, a series of articles, or a set of essays is determined by the research expectations and accepted forms of publication in the discipline, as well as by custom in the discipline and the student's program. In the humanities and some of the social sciences, the dissertation is expected to be a "proto-book," which reflects the individual scholar's approach to research and can ultimately form the basis for a monograph published by a university press. Several article-length essays, published or to be published, may be the heart of the dissertation in economics at a number of universities. In engineering and the physical and biological sciences, which are increasingly team disciplines with large groups of investigators working on common problems, dissertations often present, in varied formats, the results of several independent but related experiments. One university reported that dissertations in engineering may include, or even be restricted to, several published or publishable articles on loosely related subjects.

How a discipline normally conducts its work is distinctly reflected in that discipline's expectations for the Ph.D. dissertation. "This is as it should be," concluded one university report. "It is unrealistic, not to say unwise, to think of common standards, expectations, formats, and the like that are equally applicable . . . to dissertations in experimental physics on the one hand and English literature on the other." Formal, university-wide requirements should be sufficiently flexible to accommodate evolution in the nature and format of scholarly inquiries in each discipline.

In an effort to accommodate the different rates and directions of disciplinary evolution, eight universities participating in this study have developed options that afford departments a choice in how students may prepare their dissertations. At a ninth university, Princeton, departmental autonomy prevails; no special rules on format or style exist, and there is "a tendency to accommodate the thesis more and more to the demands of the real world—that is, to accept articles rather than monographs and in the form most broadly accepted by the discipline."

Optional dissertation forms exist at the following universities, among others: Cornell, Florida State, Georgia, Illinois at Urbana-Champaign, Iowa State, Michigan, Minnesota, North Carolina State, and Ohio State; Howard University has proposed guidelines for a publications-based dissertation. The options are called variously thesis option, manuscript style, journal format, alternative thesis-dissertation format, and multiple manuscript dissertations.

Characteristics common to these options are that the body of the dissertations may be composed of published and/or publication-ready manuscripts; the collection should have a coherent topic with an introduction presenting the general theme of the research and a conclusion summarizing and integrating the major findings; copyright issues must be resolved by the individuals involved; and at most universities, reprints or articles must be retyped to conform to graduate school dissertation format requirements.

Some universities do permit the inclusion of previously published material that has not been retyped. At North Carolina State University, for example, reprints or manuscripts may be photocopied onto required bond paper and be preceded by a single numbered page showing the chapter number and the title and authorship of the reprint or manuscript. The University of Minnesota permits binding together reprints of the manuscripts or the published articles themselves if they are satisfactorily and legally reproduced on thesis-quality paper and conform to the Graduate School's format specifications. At Ohio State University, previously published material may be photographically reduced or enlarged to fit onto 8½ x 11-inch paper, and it must be reproduced in quality suitable for microfilming. Stanford University permits the inclusion of published material if margins are adequate to allow for proper binding, if typeface

is acceptable for reproduction by UMI, and if there are no other deviations from the normal specifications that would prevent proper dissemination and utilization of the dissertation.

The Ph.D. degree *extra muros* is an exceptional option offered at Columbia University to recipients of the M.Phil. degree at any time within ten years from the date on which the degree was awarded. A recipient of that degree who has not continued studies in residence at the university may present to the dean, in lieu of a sponsored dissertation, a substantial body of independent and original published scholarly material to fulfill requirements for the Ph.D. degree. The dean, in consultation with the department, reviews the material submitted to determine whether the applicant is eligible to take the final examination. If the candidate is permitted to sit for the final examination, the committee then will judge whether the candidate's work is up to the university's standards of quality for the Ph.D. degree. The examination may be taken only once, and it is either passed or failed.

Although this document focuses on the Ph.D. dissertation, it is worth noting that several universities reported that dissertations for the Doctor of Musical Arts degree (D.M.A.) are presented in distinctive forms. At the University of Michigan the D.M.A. degree in composition consists of a composition of major proportions for symphony orchestra, and, in performance or conducting, of a series of public performances. For the D.M.A. degree at the University of Minnesota, public performance and supporting papers are offered in lieu of a thesis. Similarly, the University of Georgia requires its D.M.A. students in performance to present a series of recitals, in conjunction with a shorter written document, and its doctoral candidates in composition to write a major composition, usually for orchestra. At Ohio State University the D.M.A. student must demonstrate competence by presenting recitals (in performance) or original works (in composition) and by writing a scholarly document.

Graduate schools would be wise to honor the disciplinary differences described in this section, even to encourage them. Departments are well advised to review periodically the expectations of their discipline, the mission of graduate education, and how the dissertation serves that mission. Dissertation research should provide students with hands-on, directed experience in the primary research methods of the discipline. The dissertation should prepare students for the type of research/scholarship that will be expected of them after they receive the Ph.D. degree.

Publishability

Most reports emphasized that the dissertation should be publishable or the source of publishable materials. At a number of universities, some faculty members, particularly in the humanities, held that a dissertation need not be publishable but must show a capacity for future research, whereas faculty in the natural sciences argued that a dissertation should report original, basic research that is publishable.

A related question, which goes to the heart of what elements must be included in a dissertation, is whether the dissertation should be a document that always needs to be scaled down to become a publishable book or a series of scholarly articles or whether it could be written in that format from the outset. Proponents of one view argued that the critical apparatus of traditional research serves no useful purpose; evidence of successful research should be the production of a publishable book or articles for which such skills are not necessary. In "The Ph.D. Squid," Ziolkowski wrote, "Why should a student spend hours mastering forms that he or she will never need again? Many a new Ph.D. revising a dissertation for publication has discovered that the first things that must go are the introductory survey of research, the lengthy footnotes, and the cumbersome bibliographical apparatus often required for the dissertation."

Yet many faculty members concurred with the assertion that

> the dissertation should demonstrate (and chronicle) mastery of the topic to a degree not found in most other scholarship. Comprehensive review of all background circumstances, thoroughness of discussion, and full literature review, ordinarily unnecessary—and even burdensome—in journal articles and other academic papers, are a critical component of the dissertation. The importance of this requirement, both for the student's development and for advancing knowledge, should be stressed. The exhaustive factual and literature reviews found in dissertations provide unique and valuable reference resources.

One faculty member observed that "it may be the one opportunity in a scholar's career for doing detailed and meticulously careful research, analysis, and argument; the very features that make dissertations 'unpublishable' may be their greatest virtues."

A flexible approach to the issue is possible. At Ohio State University some programs require a literature review as part of the dissertation prospectus, rather than as an element of the dissertation. In some of these cases, the review is not incorporated into the dissertation, or is done so only in a much abbreviated form. That arrangement is reminiscent of Berelson's 1960 description of a format experimented with in the biology department at the University of Rochester. There the doctoral dissertation was divided into two parts: (a) a comprehensive and critical monograph on the subject matter of a biological or scientific field related to the research problem the student intended to investigate for the dissertation; this monograph had to be done *prior* to taking the qualifying examination, and (b) the candidate's original research, which had to be prepared as a manuscript in final form for submission to a scientific journal. Graduate students at one university participating in this study strongly supported submitting the literature review as a separate document and writing the dissertation as a manuscript for publication.

A compromise position articulated by several deans was that a literature review *per se* is not necessary but that locating the dissertation topic in relation to the rest of the field is essential. They favored a conceptual framework, a focused discussion of the past being built upon in the dissertation, and proper attribution to predecessors.

Intensive (Full-Time) Participation in Doctoral Research

Theory and practice, ideal and reality diverge on this issue. In theory, doctoral research requires full-time effort for a sustained period of time. In practice, finances force many advanced students to work as teaching assistants or even to take off-campus jobs.

The ideal of the full-time scholar applying energies exclusively to the research and writing of the dissertation is most nearly achieved in those sciences that enjoy substantial financial support and can provide students with stipends throughout their program of study. At some universities the ideal is least realized in education where students, especially those pursuing the Ed.D., are typically mid-career professionals attending graduate school part time.

Differences between the sciences and the humanities in this matter were noted in one university report:

> It is argued, with justification, that the sciences retain the 'apprentice' approach to graduate education because the nature of bench research requires it: a lengthy period of intense work is necessary to design, set up, run, and write up a series of laboratory experiments. Yet in their own research modes, humanities scholars require the same kind of constant attention to their work in order to keep ideas and insights 'in their heads,' and they derive just as much benefit from the frequent contact with their research peers. It is ironic that the scientific disciplines have inherited the medieval monastic tradition of intense, isolated study, for this was the tradition from which the humanities sprang, but which they have now lost because of irretrievable economic and social changes.

Part-time doctoral research, in particular the practice of leaving campus having completed "all but the dissertation" (ABD), is seldom in the best interest of the student and the dissertation. In the face of financial realities and disciplinary differences, however, the consensus is that a graduate school requirement that all work on the dissertation be carried out on a full-time basis would be futile and counterproductive. Ideally, an institution should be able to provide sufficient financial support so that all of its students can devote full time to the research and writing of their dissertations. Because that is not always feasible and because dissertation research activity varies so much by discipline, policy on this issue should be flexible enough to allow students to complete their degrees without compromising the quality of their dissertations.

Time to Completion of the Dissertation

Barriers to timely completion of the dissertation are myriad, but the one most frequently cited by faculty, students, and graduate administrators alike is lack of adequate financial support during the dissertation phase of the doctoral program, a problem that is especially vexing to students in the humanities and the social sciences. The 1987 National Research Council (NRC) survey (*Summary Report 1987: Doctorate Recipients From United States Universities*) found that students recording the

shortest overall times-to-degree generally had fellowships, traineeships, or research assistantships; students holding teaching assistantships registered longer times-to-degree; and those whose primary sources of support were their own earnings or loans almost always had the longest times-to-degree. Although the NRC hesitated to conclude that the associations are causal, it is reasonable to assume that students who must work on the dissertation part time while continuing to serve as teaching assistants in introductory courses unrelated to their research will take longer to finish the dissertation than will students who receive support to work full time on their research in the laboratory. Even more problematic are those ABDs who leave the university to accept full-time jobs elsewhere and therefore are able to devote only limited amounts of time to their dissertations.

Other obstacles to completing the dissertation may be grouped in three categories:

(1) *personal problems of students*, such as procrastination, perfectionism, lack of motivation, writer's block, letdown and slowdown after the tension of preparing for preliminary examinations, poor organizational skills, inability to apportion time, low morale, sense of isolation, family responsibilities, lack of motivation to finish in an unfavorable job market, devoting time to other research to build a publications record, lack of preparation for independent research, "dissertation in a drawer" syndrome while waiting for postdoctoral positions, and the program's failure to recognize a student's lack of ability and separate him or her from the program at an earlier, more appropriate time;

(2) *problems with defining the research project*, including delaying selection of a topic until after course work and preliminary examinations have been completed; difficulty in determining a suitable topic for the doctoral research project especially in such fields as the social sciences and the humanities where students are expected to define the topic with minimal assistance from the faculty; lack of proper guidance from a major professor, which results in unclear research objectives or excessively ambitious research projects; unrealisitic expectations of overly zealous faculty, as well as unreasonable student expectations regarding the contribution they are about to make to the field; and the manner in which the discipline conceptualizes what a dissertation ought to be, e.g., a "proto-book" in the humanities, and thereby influences the amount of effort and time students are expected to devote to the dissertation;

(3) *problems in conducting the research*, such as the necessity of working abroad in the field or in foreign archives; unexpected field factors such as weather, long life cycles, and other uncontrollable variables in the agricultural and biological disciplines; poor advising; data collection problems; unexpected technical difficulties with experiments; non-renewal of a research grant; advisers who do not read and return chapters in a timely fashion; a lack of clear departmental expectations for the dissertation and its progress; competition among students for faculty attention; poor direction by the Ph.D. committee; and departure from the university of the dissertation adviser or committee members.

There is obviously no dearth of reasons for prolonging the dissertation process. Not all of them can be addressed by institutional initiatives, but the following issues demand institutional attention.

Financial Support. Most faculty believe that dissertation-year support would be a boon, especially for students in the humanities and social sciences who take the longest periods of time to finish their dissertations. Such fellowships would enable students in these areas to forego part-time jobs as teaching assistants or full-time positions away from the university and to work full time on the dissertation. Finding resources for such support will not be easy, and simply subtracting money for this purpose from the funds available for pre-dissertation support will do nothing to alleviate the problem. Institutional fund-raising activities should include this kind of support as a priority of the graduate school.

Other funding measures with the potential for assisting students along the dissertation path include

(a) locating, publicizing, and encouraging applications for extramural funds that provide dissertation-year support;

(b) creating dissertation enhancement awards, funded by the graduate school or the department, to help students offset out-of-pocket expenses incurred in conducting dissertation research.

In many institutions, limits have been set on the total amount of university support a student can recieve. When students know that funding is so limited, they have a strong incentive to finish their dissertations within the prescribed time frame.

Yale University, which already sets an official time limit of six years for completion of the Ph.D.—three or three and one-half years for completion of pre-dissertation requirements, and the remaining time, i.e., two to three years for completion of the dissertation—is instituting a plan during the next three years to reduce the budget for graduate student teaching by about 20 percent. The resulting savings, supplemented by a substantial increment to the graduate school's financial aid budget, will be used to finance dissertation fellowships for advanced graduate students. To ensure that students will be able to derive maximum benefits from the dissertation fellowships, the amount of time the a student can take to complete pre-dissertation requirements will be tightened up and the six-year limit for completion of the degree will be enforced more firmly.

Pre-dissertation Course Work. The dissertation ought to be viewed as contiguous with course work, not remote from it. Graduate programs and faculty can do much to dispel the notion that the dissertation is a barrier or obstacle to be surmounted. Dissertation-type work should be encouraged from the outset of a student's graduate program, not introduced at an advanced point in the student's career. As a student progresses through a graduate program, instruction should become increasingly specialized, moving from relatively structured course work in the first year to seminars and independent study opportunities that provide more

depth and require students to undertake major research papers and independent research projects. These guided research experiences should have a common thread and lead to a series of "working papers" for the dissertation.

Involvement at early stages in a research program facilitates intensive participation and rapid progress. For this reason students in the sciences and engineering seldom report difficulties in the transition to dissertation work and in developing a topic. The humanities and the social sciences might consider developing a more "apprentice-like" model that mirrors that used in the natural sciences.

Topic Selection. A well-structured graduate program, with mechanisms promoting early involvement in research, should enable students to recognize possibilities for a dissertation topic and select a dissertation adviser no later than the end of the second year of study.

Anxiety about topic selection in the humanities and social sciences, and the difficult and time-consuming process it often is, can be greatly reduced if advisers take a more active role in suggesting possibilities and helping students narrow the field to a single, practical subject. In courses and seminars throughout the graduate program, faculty members can suggest to students specific dissertation topics in their fields, pointing out interesting knowledge gaps and theoretical puzzles. Departments can reduce the psychological hurdle of the dissertation by requiring independent study courses for the exploration of topics, making explicit their expectations about the purposes and scope of the dissertation.

Other possibilities suggested for helping students define dissertation topics include expanding writing requirements to encourage earlier crystallization of thought; allowing students to substitute a research essay for one area on general examinations; requiring research seminars or a course with a substantial paper requirement as a regular part of the first- or second-year curriculum; requiring a dissertation prospectus; institutionalizing informal, brown-bag seminars where students can test ideas without the investment of time required in formal seminars.

The greatest contribution an adviser can make to reducing years spent in the dissertation process is to help students select a manageable research topic, discouraging them from undertaking projects that are not reasonable in scope. "Since a key part of learning the process of scholarship is learning how to break a problem into answerable questions," stated one university report, "perhaps doctoral students need more help from the faculty in defining questions that can be answered in two years."

In technical fields, freedom of choice in selecting a dissertation is much more limited because students are constrained by the theme of the sponsored research with which they are affiliated. Here the problem is not extensive time taken for topic selection, but selecting and carefully negotiating with the major adviser and committee a dissertation topic that is an acceptable and interesting aspect of the adviser's research project.

Prospectus. Unless a dissertation prospectus is mandatory at a university, not all departments will require one. For those that do, the form of the prospectus can vary enormously by field, from a preliminary statement of what a student proposes to do to a document that is nearly equivalent to the completed dissertation. Where a prospectus is required, its objective should be to get the student to begin thinking about the dissertation at an early date, and to formalize those thoughts so that they can be presented to an advisory committee. The involvement of this committee at an early stage can provide additional guidance to the student and identify problems (and their solutions) at the early stages of dissertation work.

Length of Dissertation. Both Ziolkowski in "The Ph.D. Squid" and the report on "Institutional Policies to Improve Doctoral Education," recently prepared by the Association of American Universities, noted that the excessive length of some dissertation projects is a major contributing factor to extended time-to-degree. Ziolkowski stated unequivocally that "universities should impose a strict upper limit on theses and refuse to accept those that are too long. This would teach students early in their careers about the realities of publication deadlines and length restrictions."

Isolation. The isolation of the dissertation writer may be a central problem impeding progress toward dissertation completion. Students in the humanities and social sciences who do not work in a laboratory often feel thrust into a lonely vacuum when they enter the ABD stage. Departments can offer ABDs special workshops and interdisciplinary seminars where they can discuss ideas and common problems with other students and faculty members. Sharing ideas in a community of scholars can revive momentum in an individual student's work.

Regular Consultations with Adviser and Committee. Regular consultations between the Ph.D. student, adviser, and committee are essential, important, and a means to encourage timely completion of the dissertation. Both student and adviser should be responsible for seeing that such meetings take place on a regular basis.

Periodic Reviews of Student Progress. A key factor in time required to complete the dissertation may be the extent to which faculty monitor student progress. This can range from routine semester-by-semester evaluations of all graduate students, to annual reviews, to years of drifting along without either formal or informal review of the student's progress. "Departmental committees," proposed Ziolkowski in "The Ph.D. Squid," "should monitor every stage of the process and make sure that the candidate understands the expectation that a reasonable topic can be managed in two or, at most, three years."

Every department should do at least an annual review of student progress, and share those assessments with the student. Students who are falling behind in their work should be urged to correct the situation. At one university the dissertation progress report form is filled out by the student, reviewed—with comments—by the adviser and the director of graduate studies, then sent to the graduate school. Without this

annual review form, a student cannot register. At universities with large numbers of graduate students where such a procedure could add unduly to departments' bureaucratic burdens, the review could be required, on an annual or a semester-by-semester basis, but reports would not have to be sent to the graduate school unless there was a problem. The absence of such reports in the student's file would indicate satisfactory progress.

Time-to-Degree and Degree Completion Data. Graduate schools can collect and make available to students and faculty data on how long students take to complete their dissertations and their degrees in every department and with every faculty adviser. Additionally, data on completion rates should be collected on a longitudinal basis.

If the graduate school's periodic review of time-to-degree and completion rates of students working with certain advisers indicates problems, faculty advising loads should be monitored and, if necessary, regulated to ensure that advisers have sufficient time available for effective advising and for timely reading and commenting on dissertation chapters.

Over-ambitious Goals and Expectations. Perhaps the greatest service graduate schools, departments, and advisers can perform for Ph.D. candidates is to debunk the mythology of the dissertation as magnum opus. Students are plagued by the temptation to read one more article, run one more regression, incorporate one more argument, do one more experiment. Sometimes this is necessary in order to produce an acceptable piece of scholarship, but at some point students and their faculty advisers must decide that the dissertation is finished, and that other related work can be done later. Perfection is not possible, and students should not be excessively delayed, or paralyzed, by its pursuit. Students need to be reassured that a reasonably thorough piece of work—William Bowen's "demonstration that [the student] has mastered the tools of independent research and has made at least a modest contribution to knowledge"—is attainable and sufficient. The dissertation is, after all, supposed to be the beginning of a student's scholarly work, not its culmination.

Guidance for Dissertation Advisers

Adviser-advisee relations are pivotal in a Ph.D. candidate's progress through the dissertation and development as an independent scholar. Despite the central importance of this relationship, most universities offer faculty members little or no guidance on that role. Expressing a widely shared sentiment, one graduate dean commented only partly in jest, "Generally we feel that faculty members are born with the capacity to supervise dissertation research just as they are born with the skills of teaching."

Reluctance to offer guidance to faculty members on their roles and responsibilities as dissertation advisers is rooted in respect for the autonomy of faculty members in

supervising their students' doctoral research. Graduate schools preside over highly decentralized domains and are hesitant to take action that would be labeled as intrusive or erosive of academic freedom. In the light of widely varying traditions in individual fields, the concept of central control also seems unrealistic. Moreover, the prevailing belief is that faculty members learn how to be dissertation advisers through their own experiences as doctoral students and as teachers—a haphazard approach at best.

Despite these reservations, there is a growing sense at a number of universities that the graduate school and departments should take more deliberate action to strengthen the effectiveness of this aspect of graduate education. In a dynamic, changing research environment where fields are becoming more subdivided and specialized and departments no longer share a common set of research paradigms, the role of a dissertation adviser in guiding an advisee through the maze acquires new weight. Moreover, graduate students tend to be less sanguine than faculty about the state of dissertation directing. Indeed, many students believe that not every faculty member is a "born" adviser of doctoral students, and that graduate schools, as well as departments, should take steps to improve the quality of dissertation directing.

Problem Areas. Graduate students in the humanities, and to a somewhat lesser extent in the social sciences, often have far too little guidance in the selection and development of manageable yet sufficiently significant dissertation topics, whereas in the sciences and engineering dissertation topics are determined by research funding and students may have too little room for originality and independence. A better balance in each of these clusters of disciplines would be beneficial.

Another issue is the vulnerability of graduate students who may be victims of the arbitrary use of power by advisers and committees. Added to this concern are student complaints about the inaccessibility of professors and inadequate advising, about the failure of faculty members to read dissertation chapters and return them with dispatch, as well as about perceived racist or sexist attitudes. Students need to have some recourse, some avenues for safely addressing grievances against the caprice of faculty members. At one university, for example, students meet at least once a year with their advisory committees, in the absence of the adviser, so that they may register complaints, if any, against him or her.

Problems can arise whenever patents, money, and/or confidential material are involved. In cases where graduate students' research is enmeshed in their advisers' projects, many difficult questions arise about the evaluation of students' work, about the ownership of data, and about providing a complete research experience for the students. The danger exists that a student in a high-powered scientist's laboratory may be no more than a high-powered technician. It is critical in such cases that clear, written understandings be formulated at the outset about a student's research and about the respective rights of student and dissertation adviser to the data generated and other products. Faculty and students alike need to be aware of the legal interpretations of these rights in different fields and under the varying conditions imposed by funding agencies. In establishing intellectual rights to the text and

substance of the dissertation, universities should also clarify what constitutes copyright protection as opposed to patent protection.

Good Practice. Some universities already have in place policies, procedures, and guidelines that constitute or encourage good practice in dissertation direction. A brief review of those practices is instructive.

Careful scrutiny and periodic recertification of faculty members who may direct dissertations is a practice at a number of universities. Appointments to the graduate faculty are stringently reviewed by university committees and are made for renewable terms of three, five, or seven years. To be appointed or reappointed, faculty are expected to have a record of scholarly activity and involvement in graduate education.

Departments may provide new faculty members with on-the-job training. During a period of apprenticeship, junior faculty members may be restricted to directing master's candidates and/or serving as members of doctoral committees for several years or for a specified number of committees. Co-advising with senior faculty members is another effective form of training so long as students are told clearly which faculty member is responsible for advising on which matters. In one department each new faculty member is assigned to work with a senior faculty member who helps acquaint him or her with university practices and expectations.

Workshops held at the graduate school or school or departmental level can help junior faculty understand their duties as dissertation advisers. Indiana University's program includes presentations by graduate school staff about the organization of the graduate school, how it formulates and communicates its rules, and the nature of the relationship between professors and their students, and discussions by three senior faculty members about what they believe to be the most important considerations in directing dissertations.

Several graduate schools appoint their own representative to serve on every dissertation committee for the express purpose of protecting the interests of the student, the advisory committee, and the graduate school. This representative is usually a faculty member in a department other than the one in which the student is working who can serve as a disinterested party to whom the graduate dean may turn for judgment and counsel if questions arise about the student's plan of work, advisory committee, the dissertation, or the preliminary and oral examinations.

Handbooks or manuals on dissertation advising, prepared by the graduate school or preferably by the departments based on guidelines formulated by the graduate school, inform both faculty and students of their respective rights and responsibilities in relation to the doctoral dissertation. The manuals may spell out expectations for all academic stages of graduate education, but the dissertation phase should be given special emphasis. Some universities are already distributing the Council of Graduate Schools' booklet, *Research Student and Supervisor: An Approach to Good Supervisory Practice*, as one way to address this issue.

A reverse approach is to guide graduate students in their choice of a dissertation adviser. The graduate school at the State University of New York at Stony Brook

gives entering graduate students a list of questions they should ask about a faculty member before selecting him or her as a dissertation adviser. The graduate school advises students to meet all the faculty in their programs and talk with other students in the program about the attributes of various advisers. "Assume nothing and ask everything about faculty. Some things you can ask the faculty directly, others you should try to ascertain from senior students. . . . Remember, also, that the faculty members will have their own questions about you, and that this is a two-way street." All entering graduate students are also assigned an adviser who will give them guidance until they present a dissertation proposal and select someone to serve as their dissertation director. Students may change advisers if they wish.

Graduate schools and graduate deans also give faculty members intellectual reaffirmation through awards for graduate faculty who are conspicuous for their contributions to graduate education. Winners of the awards may be noted for their effectiveness and thoughtfulness as advisers for dissertation writers, and for well thought-out graduate seminars. Awards for distinguished dissertations across disciplines also bring recognition to the supervisor as well as to the student. Such honors raise faculty awareness about the importance of being conscientious dissertation directors and reward those who are effective in that role.

Universities provide another incentive for responsible dissertation supervision when they give more weight to dissertation advising in salary and promotion decisions. Efforts to develop a system for evaluating dissertation advising may accompany this practice.

Elements of Handbooks for Dissertation Advisers and Dissertation Writers. Departments should prepare handbooks for dissertation directors and students that codify what the discipline expects of graduate education and the dissertation. Copies of the handbooks should be available in the graduate school and should be given to every faculty member and student so that everyone is aware of and plays by the same ground rules. Faculty members and advanced graduate students should be involved in developing the handbooks, which will explain departmental practices, rules, regulations, and rationales. Guidelines should focus on the mutual responsibilities of advisers and students. The graduate school should not dictate the contents of these statements, but can usefully suggest what elements the department should address in them. Departments may wish to prepare documents outlining all stages of graduate education, with a prominent section devoted to the dissertation, or they may wish to treat the pre-dissertation and dissertation stages in separate handbooks.

Departments should consider including the following elements in a guide for graduate students. The object should be to provide reasonably explicit, justifiable guidelines that are understood by student and adviser alike.

> (1) targets for the periods of time needed to complete each major stage in doctoral studies: course work, master's thesis (where applicable), qualifying examinations, dissertation prospectus, and completed and defended dissertation;

(2) a detailed statement of all procedures within the department involving the Ph.D. program, including admission requirements; degree program requirements; procedures for the selection of adviser and advisory committee; the dissertation advisory process; the availability of appeal procedures; requirements, schedules, and procedures for dissertation proposals, comprehensive reviews, or examinations, if any; preparation of the dissertation, and procedures for its evaluation, including an oral defense;

(3) a set of questions graduate students should ask about a faculty member before selecting him or her as a dissertation adviser, accompanied by advice to meet all the faculty in their programs, and to ask the appropriate questions both of faculty members and of other students in the program;

(4) a statement giving the maximum number of years a student will be supported in pursuit of the doctoral degree, with the possibility of exceptions if extenuating circumstances arise;

(5) an annually updated list of graduate students with their dissertation topics and the names of their supervisors;

(6) an annually updated list of departmental members of the graduate faculty with information about their fields of research and specialization and selected publications, their availability for supervision, their telephone numbers and office locations, expected periods of absence, and retirements;

(7) the availability of financial assistance from the department, the university, and external sources;

(8) a statement of how a student's individual contributions to a collaborative research project will be identified and evaluated, whether by the student's adviser and advisory committee or by some other mechanism;

(9) a statement of university guidelines on property rights to dissertation material (see point 6 below under guidelines for dissertation supervisors).

Guidelines or a handbook for dissertation directors prepared by each department should include the following items:

(1) the appropriate scope and ambition of a dissertation project in the department so that faculty are not excessively demanding;

(2) a list of pitfalls to be avoided in assigning or suggesting dissertation topics to students, so that false starts; dead ends; excessively ambitious, "global" topics; and other high-risk/low-yield projects are eliminated to the extent possible;

(3) departmental expectations of the speed with which faculty members should read and return chapters and other written materials to students so that they do not have to await faculty feedback for excessively long periods of time;

(4) departmental expectations about the period of time in which dissertation research and writing should be completed once all other requirements for the degree have been fulfilled;

(5) departmental conventions and understandings about the writing of a dissertation, such as the degree to which collaborative work is accepted or expected, and how previously published material relevant to the dissertation is to be handled;

(6) the departmental or university mechanism for identifying and evaluating a doctoral student's individual contributions to a collaborative research project, determining whether the responsibility resides with the student's adviser and Ph.D. committee or with a committee established at the disciplinary or graduate school level for that purpose;

(7) a statement of university guidelines on property rights to dissertation material; there should be written understandings about a student's research and about the respective rights of student and dissertation adviser to the data generated and other products, with a clarification of what constitutes copyright protection, patent protection, and federal law governing collaboration and sponsored research. If such guidelines do not exist, they should be developed by the university.

Dissertation Defense

Thirty years ago Berelson raised serious questions about whether the final oral examination, or defense of the dissertation, had become only a ritual, without a useful function. Yes, replied about half of the faculty and recent degree recipients, and about a third of the deans surveyed. Given these sentiments and estimating that oral examinations required from 3,000 to 4,800 faculty hours at a university awarding 300 doctorates a year, Berelson questioned whether the defense justified the expenditure of time by busy professors and whether a more economic substitute could be found.

Some thirty years later the demise of the dissertation defense is far from imminent. Of forty universities addressing the issue for this study, only three reported that an oral defense of the dissertation is not required for all doctoral students. At two of these universities, departments have the option of requiring or waiving the defense. At one of them, approximately half require it and half do not. At the other, only seven of ninety-six departments require an oral defense of the dissertation; final approval can be obtained instead if three faculty members read and sign the dissertation. The third institution requires an oral examination, but not a defense of the dissertation. The required oral can be a general examination on the discipline, an oral examination on the dissertation proposal, or an oral examination on the dissertation. Most departments use the third option, and currently there is serious discussion about eliminating option one.

At the other thirty-seven universities, the dissertation defense is considered an indispensable part of graduate education and the climactic act for the Ph.D. candidate. Even at these universities, however, faculty members may be divided in their judgments on the importance of the defense. Some faculty members and

departments share the sentiments reported by Berelson that the oral defense is purely ceremonial and of little or no substantive value; most, however, defend staunchly the virtues of an oral defense.

Rationale for the Defense. For the student, the defense should be a "crowning experience," the ultimate opportunity to demonstrate his or her expertise after years of research, reporting, and writing. It is also excellent preparation for future professional presentations where defense of one's work is an accepted part of standard professional meeting structure. For other doctoral students who attend the examination it is a learning experience, conveying guidance on the formulation and completion of a dissertation project.

In this age of collaboration and team research, especially in the sciences, the oral defense is a premier opportunity for the faculty to verify the independent contribution of the student. It forces the student to define clearly his or her role in the collaborative project and to articulate the place of the dissertation in the research project and in the student's discipline.

The dissertation defense permits departments to share results of some of their major intellectual activities; serves as a check on the uniformity of quality within the department and across disciplines; and holds the adviser and the committee members accountable, guarding against an adviser who may be excessively lenient or an examining committee member who may be excessively difficult and recalcitrant. Ideally, the prospect of a public defense also should ensure that committee members read the dissertation with care. That ideal, unfortunately, is not always realized. Moreover, graduate students at one university expressed concern that a student may fail a defense if committee members do not read chapters carefully as they are produced and do not voice their criticisms prior to the defense.

Format. The format of an oral dissertation defense varies among disciplines and universities. Several graduate deans appoint a graduate school representative for each defense, i.e., a faculty member with expertise in the student's area who will read the dissertation, attend the defense, and submit an evaluation of the dissertation and defense to the dean. Many graduate schools require that the committee include one or two faculty members from outside the department, and much more rarely from outside the university, to ensure quality control across disciplines.

At some universities the defense in some departments is primarily ceremonial because a student is not allowed to defend a dissertation until the supervisory committee has approved it. In other departments, the defense takes place before the dissertation has been accepted but when the committee is ready to make a decision. The result may be a pass, a failure, or a provisional pass with stipulations about revisions that must be made before the dissertation will be accepted.

The audience at an oral defense may be confined to the examining or supervisory committee or open to all interested members of the scholarly community. In some disciplines, notably the sciences, the defense may begin with a seminar at which the

doctoral student presents his or her research to the public, followed by an examination period open only to the supervisory committee or to graduate faculty members.

Whatever the accepted procedures, one graduate dean observed that the oral dissertation defense

> helps to ensure some uniformity of quality across the school, to prevent idiosyncratic views of advisers or departments from prevailing, and to avoid an unnecessary institutionalization of the hermetic quality of doctoral research in many fields. Being a Ph.D. student is often a fairly lonely experience, and it is imperative to end the process with a ritual that integrates the student into the academic world and forces the student to bring the product of research into the larger scholarly context. . . .

Expert Advice, Editorial Help

Graduate schools and departments walk a fine line when determining what expert assistance a dissertation writer legitimately can secure. Some degree of latitude is permitted in purchasing both statistical and editorial assistance. One university report indicated that students should be required to demonstrate statistical proficiency, but that they should be allowed to use programmed instructional software, rather than programming it themselves. Faculty members at another university agreed that specialists in statistical analysis of computing could be hired, so long as the research committee decided that this was not part of the expertise the student should demonstrate in the dissertation. Help in collecting the data, as opposed to analyzing it, also was deemed acceptable.

Because a doctorate should signal a high degree of literacy, it is important that doctoral degree recipients be able to write coherently about their areas of expertise. "Ghost-written" dissertations are obviously unacceptable, and faculty opinion is divided about what form of professional editorial assistance a student should be able to purchase. Some light editorial assistance with the language, not the substance, of the dissertation seems to be permissible, but wholesale rewriting is not. One suggestion was that a professional editor should not change the style or content of the student author, attending instead only to surface features, and that the adviser should review a preliminary draft prior to its submission for editing.

Looking to the Future: Changing Research Topics or Methods

Recognizing that new knowledge, new technology, and other developments may alter research questions, techniques, or paradigms, one university asked its faculty to discuss this question: "Have research topics or methods in your discipline changed in the recent past, and/or are such changes likely in the foreseeable future? If so, in what ways will the dissertation be affected?"

The emergence of computing technology and its effect on what is possible in the research arena was the primary change cited. The effects of this factor are multiple:

> Access to the San Diego Supercomputer has made it possible to research questions that could only have been approached theoretically in the past;

> library computerization has greatly expanded the capacity for thorough explorations of academic literature; increased accumulations of both local and national data bases . . . have made information readily available and manipulable; the expansion of remote sensing makes more study of the earth possible (not only for geologists and climatologists, but also for anthropologists), while recent and upcoming space probes will open new vistas for planetary scientists . . . ; increasingly powerful modeling techniques and related software facilitate rapid review of a large range of alternatives (from architectural stresses to demographic mapping to economic planning). . . .

Doctoral research will be affected by this computing technology, in the topics that can be addressed, the techniques used, the skills required, and the speed with which results can be reached. An archaeologist observed that "use of sophisticated data systems has opened up new realms of inquiry that would previously have been deemed too unwieldy."

A second consequential change is the extent to which collaborative research teams are being formed to address complex scientific questions. Graduate students participating on such teams have the opportunity to conduct sophisticated research at the edges rather than at the center of their disciplines. The trend toward group or center funding facilitates multidisciplinary yet focused research, but reduces opportunities for the individual scholar to go where curiosity leads. "Such individually eccentric scholarship . . . is likely to become more rare in an era when funding and equipment needs make it necessary to research questions in which there is governmental or foundation interest."

An enormous expansion of the knowledge base in all disciplines will continue to affect the formulation of dissertation topics and the conduct of research. Similarly, changing canons, particularly in literary studies, which have been altered by women's studies and ethnic studies, will influence increasingly the choice of dissertation topics and methods. Because fields are in flux, a common set of research paradigms is replaced by multiple paradigms, which add to the dynamic, changing research environment. Departments and Ph.D. students laboring on dissertations will experience less and less commonality about the fields and about good practice.

Conclusions

There is no question that, in the view of the faculty, students, and administrators participating in this study, the doctoral dissertation, as a demonstration of a student's ability to carry out research independently, defines the essence of the Ph.D. degree. Furthermore, with few exceptions, the dissertation in its traditional form, that is, as a document that describes in detail the research that was carried out and the results obtained, the relationship of that research to previously reported work in the field, and the significance of the research in furthering understanding of the issues in question, continues to represent the model in all fields.

In that context, several strong themes emerged during the course of this study. In the sciences and engineering two factors associated with the way research is done affect the nature of the dissertation. One is that researchers in these fields usually publish their work in the form of short articles in the scholarly literature, and, as a consequence, graduate students completing their dissertation research already may have published some of their results.

The other is that increasingly graduate students in these fields work in groups involving other graduate students, faculty, and often postdoctoral researchers. In addition to raising questions about the contributions of any individual student, this team approach also results in publications with several authors, and the relationship of these publications to a dissertation that is supposed to represent the student's own work also must be questioned. Most universities have developed satisfactory procedures for dealing with these issues without compromising either the rigor or the integrity of the doctoral process.

Another quite different theme has to do with the nature of the relationship between doctoral students and their dissertation advisers. Although most faculty appeared to be generally satisfied with their roles as advisers, that view was not always echoed by graduate students or graduate deans, and much of the discussion by participants in this project dealt with this issue.

This publication abounds with suggestions from participating universities and task force members about ways to enhance adviser-advisee relations and to help students complete their dissertations in a timely fashion. Disciplinary diversity affects all aspects of the role and nature of the doctoral dissertation, and no set of university-wide standards and requirements can afford to ignore the differences in how scholars in the various disciplines conduct their work and how those differences are reflected in expectations for the Ph.D. dissertation. The graduate school, however, can set forth general requirements for the dissertation; provide options for publications-based dissertations; give departments guidance on the elements to be included in handbooks that codify departmental expectations for graduate students, advisers, and the dissertation; schedule workshops and encourage other forms of on-the-job training for dissertation advisers; and recognize faculty contributions to graduate education and dissertation supervision through awards, salary, and promotion decisions.

Ultimately, however, the responsibility for making the process work lies with the faculty and students. New sensitivity to graduate student needs is called for in today's complex and changing research environment. At the dissertation stage nothing should be done to diminish the necessary rigor of the research apprenticeship, but much can be done to minimize unnecessary frustration and to improve the process. From the outset faculty members can encourage Ph.D. students to view the dissertation as a demonstration of their capacity for independent work rather than as their magnum opus and help them select manageable topics that can be completed within two to three years. Early involvement of graduate students in scholarly research that prepares them to do their own dissertation projects, handbooks giving explicit departmental guidelines and expectations for the dissertation, annual or more frequent reviews of student progress, accessible advisers who read promptly and comment constructively on draft chapters, dissertation-year support in fields where it is normally not available—these and other factors that facilitate progress on the dissertation also will foster the intellectual interchange between graduate student and faculty member that is essential if doctoral education is to flourish.

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Appendix A

Working Paper for the CGS Study of The Role and Nature of the Doctoral Dissertation*

Graduate school handbooks usually describe two purposes for doctoral dissertations. One is to demonstrate the candidate's ability to address a major intellectual problem and arrive at a successful conclusion independently and at a high level of professional competence; the other is to make an original contribution to knowledge in the field. There seems to be general agreement that there is a specific type of document called a dissertation that is appropriate for accomplishing both of these purposes. Furthermore, the fact that the dissertation is always described generically, with reference to the Ph.D. degree, rather than in terms of individual disciplines, lends weight to the idea that there is a concept of doctoral research that is not dependent on the field of study but rather on the level of the degree. Many graduate school bulletins are quite specific about the fact that the preparation and defense of a dissertation is the one absolutely essential part of all Ph.D. programs. In addition, the dissertation, in terms of intent and form, is almost always defined by the graduate school. While some departmental variation may occur with respect to format and related issues, the idea that all doctoral students must demonstrate a certain level of scholarly accomplishment in order to qualify for the Ph.D. degree seems firmly entrenched. This kind of research, and the dissertation itself, are often described using the same words: substantial, significant, original, and independent.

During the past thirty years, however, the nature of much of the research done in universities has changed so that in many fields, particularly in the sciences, doctoral research seems to have lost some of its distinguishing characteristics and has come to resemble research done in settings not involved with graduate education. Today, students, faculty, and others may work in teams, and research results are often published as short papers with several authors. It is not unusual for graduate students to work on several projects, and to publish a number of papers prior to finishing their degrees. In response, some universities have modified their policies regarding the dissertation, and now accept previously published material and work done by more than one author as part or all of a dissertation. Moreover, some departments no longer require defense of the dissertation, apparently on the grounds that acceptance of the work by peer-reviewed journals constitutes successful defense.

These are not new options; some of them have been available at several universities, in one form or another, for years. Yet there continues to be vigorous debate in the academic community about the kind of research scholars believe to be essential in doctoral education, and about the range of possibilities acceptable for demonstrating ability to do that kind of research. For the most part, differences of opinion split along

*Some U.S. institutions use the term "dissertation;" some use the term "thesis." Canadian institutions use "thesis." For purposes of study the terms "dissertation" and "thesis" are interchangeable.

discipline lines, with some scientists arguing that the traditional dissertation is an anachronism, particularly in terms of how research is done and reported, while some humanists take the position that the aforementioned options vitiate the dissertation as a demonstration of independent scholarship.

Consideration of these and related questions about what is acceptable as a dissertation leads very quickly to more basic questions: Is there consensus among scholars as to the purpose of doctoral research? Is the dissertation seen as a rite of passage in which perseverance may count for as much, or more, than intellectual content? What is the purpose of the dissertation, and what must a dissertation be to serve that purpose? What is the nature of the adviser-advisee relationship, particularly with respect to defining the scope and focus of the dissertation? How does the time it takes to complete the dissertation relate to what we believe the purpose to be? Current concern about the steady increase, year by year, in the time it takes to obtain the Ph.D., and about those who complete all but the dissertation, makes these questions particularly timely.

Because of the dominant role of dissertation research in the doctoral process, and of the great variation, field-to-field and institution-to-institution, in both philosophy and practice related to this topic, it has become increasingly important to understand how scholars view these issues and to make that information available to the academic community, prospective students, and the general public. In order to do this, we intend to:

1. Obtain a good idea of the current range of thought, opinions, and options regarding the doctoral dissertation and doctoral research in graduate schools in the U.S. and Canada. We will do this by gathering together the reports of your study and those of your colleagues at other participating universities.
2. Formulate a clear picture of good practice with respect to what dissertations are supposed to do and what they are supposed to be. This will take place through analysis of the reports and discussion with the graduate deans.
3. Produce a CGS document intended for widespread distribution that provides a rationale, context, and guidelines for institutions to use as they consider their own policies relative to the role and nature of the doctoral dissertation.

The following material has been developed to help focus your deliberations.

A. **Questions**

1. What characterizes an appropriate doctoral research project? Is there a consensus, across disciplines, about the distinguishing characteristics of doctoral research?
   a. If there is, what is it?
   b. If there is not, what are the points of disagreement?

2. Is there a consensus, across disciplines, about the distinguishing characteristics of the doctoral dissertation? This is not a question about format, but about concept.
   a. If there is, what is it?
   b. If there is not, what are the points of disagreement?
3. If originality is one of the distinguishing characteristics, how is it defined?
   a. Must the idea for the project be the student's?
   b. Must the approach used be developed by the student?
   c. Must the student be able to demonstrate that some or all of the project represents an original contribution by the student?
4. Are students allowed to use work done in collaboration with others as all or part of the dissertation?
   a. If no, why not?
   b. If yes, do students have to define what part of that work represents their own individual efforts?
      c. If yes, can several students obtain the Ph.D. using the same research for the dissertation, with each writing a separate document from a different perspective?
      d. If yes, can several students obtain the Ph.D. using the same dissertation? That is, can there be a dissertation with several authors?
5. Can the student's previously published work be included in the dissertation?
   a. If no, why not?
   b. If yes, can this be in the form of reprints or does it have to be rewritten for the dissertation?
   c. If yes, does any additional written material have to appear that binds the previously published work together into some format with a beginning, a middle, and an end?
   d. If yes, does any previously published material used in the dissertation have to exhibit a programmatic thrust?
   e. If yes, is there any restriction on what kind of previously published material can be used (e.g., single author articles, multi-author articles, articles from certain journals only, technical reports, abstracts, notes, etc.)?
6. Should one or more article-length essays be allowed to constitute all or part of humanities and social sciences dissertations?
7. Should any part, or all, of doctoral research require intensive (full-time) participation by the student? Rationale?
8. The equivalent of two years of full-time work after admission to candidacy is often mentioned as being appropriate for the doctoral dissertation. Given that it is not possible to predict at the outset how long it will take to complete any piece of original research, does the two-year figure seem consistent with:
   a. the expectations of faculty and students at your institution?
   b. the experience of faculty and students at your institution?

Are there consistent variations by discipline?
What seem to be the principal barriers to timely completion of the dissertation?

9. Is any attempt made, by the graduate school or departments, to provide guidance to faculty with respect to their role as dissertation advisers?
   a. If no, why not?
   b. If yes, does this extend beyond technical functions to issues related to directing and guiding advisees?

10. Are all students required to defend their dissertations before a committee of faculty?
    a. If no, why not?
    b. If yes, why?

B. **Terms and Definitions**

Several terms related to the dissertation appear repeatedly in descriptive material prepared by graduate schools. Among these are "intensive," "substantial," "significant," "original," and "independent." Actually, most of these terms apply to the research done by a doctoral candidate, but have come to be used to define the document that describes that research as well. It may be useful to dwell briefly on each of these terms.

a. "Intensive"—refers to the research rather than to the document and means that students spend a period of time occupied solely with research on the dissertation. This is usually the period of time after the student has been admitted to candidacy, and many graduate schools have rules about the minimum amount of full-time work that must be done during this time. The idea of intensive work or total immersion in one's dissertation project certainly bears some examination with respect to the entire question of time to degree since in many fields the dissertation work is stretched out over a very long period during which students may be occupied in other ways, whereas in other fields the dissertation work clearly is intensive and all-consuming.

b. "Substantial"—this can be taken to mean that the research is not minor or short-term, but has substance and depth. The interpretation of this term relates directly to the question of the length of time it takes to complete the dissertation. One view, expressed by William Bowen in his 1981 President's Report at Princeton, is that the dissertation may be thought of "... not as a final magnum opus, but as a demonstration that [the student] has mastered the tools of independent research and has made at least a modest contribution to knowledge."

c. "Significant"—this has to do with the choice of topic and with the impact of the research. A significant piece of work might be defined as one that affects the way scholars in a particular field think about that field. At the very least, it should be useful to scholars working in the field. The significance of work done in doctoral dissertations is subject to some question. That doctoral

dissertations are significant contributions to knowledge seems to represent an ideal, rather than something quantifiable or an actual requirement for the degree. There is also a question of whether the dissertation itself is a significant document, or whether the term refers only to the nature and quality of the research. Since in many fields dissertations apparently play a minor role as scholarly resources, it would be hard to make an argument that the dissertations themselves are significant.

d. "Original"—if this is taken to mean the student's own ideas, including the origination of the project, there are wide differences field to field in how this term is used. In those fields where students work on research projects that have been funded on the basis of proposals written by their advisers, the original ideas clearly are not the student's, and yet students do make original contributions to these projects, usually in close collaboration with an adviser. This is quite different from what one may find, for example, in the humanities, where the idea for the dissertation is usually much more, if not completely, the student's. We should note, however, that original may not mean singular in the sense of a brilliant hypothesis, theory, or new methodology. Original can mean some heretofore unexplored albeit not necessarily important topic, subject, or figure.

e. "Independent"—this seems to imply that the work was done by the student and only by the student and that the dissertation was written by the student. Again, that may be the case in some fields, but in others it clearly is not, particularly in those fields where students work in research teams under the close supervision and often with the active participation of faculty and postdoctorates.

Your comments on these terms, together with those of your colleagues at other institutions, will be helpful in preparing the final report.

CGS Task Force on the Role and Nature of the Doctoral Dissertation

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Appendix B

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Cornell University, Ithaca, New York
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Howard University, District of Columbia
Indiana University, Bloomingdale, Indiana
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Northern Illinois University, DeKalb, Illinois
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